AGEING EARLY LIFE STAGES OF Octopus vulgaris
EFFECT OF TEMPERATURE
Wild and cultured populations of common octopus (*Octopus vulgaris*) have a high economic value worldwide.


We planned a comparative analysis of wild and cultured paralarvae of similar age (gene expression, physiology, biochemistry, larval behavior, ecology).

Understanding early stages in the wild and the optimization of culture conditions.

**Aim** – Age estimation of wild paralarvae in *O. vulgaris*
The samples

52 wild paralarvae caught in NW Atlantic

- Oceanographic vessel of IEO
- Sampling: Multinet 200 µm, 2m diameter.
  Hauls of 15 min, 2 knots, at 10-20m depth

37 paralarvae (0-22 days) reared at 14°C
Similar temperature than wild samples

33 paralarvae (0-30 days) reared at 21°C
Optimal culture temperature
Age estimations

Daily increments validated in beaks of early stages up to 98 days old

- Transmitted light 400X, DIC-Nomarski

- Two readings. Precision calculated by Coefficient of Variation (CV-Campana, 2001)

<table>
<thead>
<tr>
<th>Paralarvae set</th>
<th>Mean CV</th>
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<tbody>
<tr>
<td>Cultured 21ºC (N=33)</td>
<td>6.71</td>
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<tr>
<td>Cultured 14ºC (N=37)</td>
<td>5.24</td>
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<tr>
<td>Wild (N=52)</td>
<td>4.73</td>
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RESULTS - Beak reading improvements

Identification of the first increment

- Hatchlings showed 1-3 increments: mean values of 1.6 increments at 14°C and 1.7 increments at 21°C

Delimitation of reading area:

- Located in the Rostrum, joined to the Hood in early stages
- Shoulder out of the reading area
RESULTS - Beak increments in captivity

\[ y = 1,0932x - 1,7 \]
\[ R^2 = 0,986 \]

\[ y = 0,0522x^2 + 1,3248x - 1,6 \]
\[ R^2 = 0,8757 \]

- Optimal (21°C) = 1 increment/day
- Cold (14°C) < 1 increment/day
Growth in captivity

Dry Weight of the paralarva (mg)

- 21ºC Artemia
- 14ºC Artemia

Age (days)

20 days old

21ºC

14ºC

20 days old
Mean environmental data for all the capture locations:

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<tbody>
<tr>
<td>DEPTH (m)</td>
<td>18.5</td>
<td></td>
<td></td>
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<tr>
<td>TEMPERATURE (ºC)</td>
<td>14.3</td>
<td></td>
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<tr>
<td>SALINITY (‰)</td>
<td>35.6</td>
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Captures during spawning season:

**May - September 2015**
Ages of wild paralarvae

Estimated according results obtained at 14°C

**Wild paralarva (4 increments)**

\[
y = 0.0522x^2 + 1.3248x - 1.6
\]

\[R^2 = 0.8757\]
Beaks of paralarvae reared at cold waters (14°C) showed age underestimation with <1 increment/day in beaks, but at optimal temperature displayed daily increments. Several hypothesis are feasible:

- Overlapping of increments when growth slow down, as observed in experiments at 14°C,
- Periodicity is daily in culture at 21°C but it may change with water temperature

Next steps - laboratory experiments to cover the thermal range of wild early stages
Thanks for your attention

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